

Ruff and Plato at Berlin. The method employed by these workers was in principle that of Matthiesen, but by suitable construction of apparatus and regulation of temperature much better yields were obtained, and the metal was thus prepared in larger quantities. Borchers and Stockem electrolysed molten calcium chloride, which was maintained at a temperature below the fusing point of calcium; they ascribe the low yields at higher temperatures to the reaction of fused calcium with calcium chloride to form a subchloride. Using an iron rod as kathode, they obtained a metal sponge which was pressed with tongs before removing from the electrolyte. The raw material prepared in this way contained some 10 per cent. of calcium chloride, which could, however, be almost entirely removed by subsequent fusion of the metal.

The final step in the evolution of the commercial process was taken by Suter and Redlich, of the Elektrochemische-Werke, Bitterfeld. By the ingenious employment of a kathode which only just touches the surface of the fused calcium chloride, they obtain a small layer of fused calcium under the kathode; before the calcium has collected in sufficient amount to flow away the electrode is very slightly raised; the metal thus comes into a cooler zone and solidifies. By continuing the process a rather irregular rod of calcium is built up, which itself forms the kathode. The metal is supplied in these rough rods, which in outward appearance strongly resemble cabbage stalks, but show a white metallic surface when cut through.

The present price quoted in Germany is about 20s. a kilogram retail, or 12s. a kilo. in 100 kilogram lots, which quotation alone proves the feasibility of the process. The technical product is said to contain about 97.11 per cent. pure calcium, 1.64 per cent. calcium chloride, and 0.4 per cent. sodium. If one may judge by the case of metallic sodium, there will doubtless be difficulties in finding any large demand for the metal, but it will obviously be much appreciated for experimental purposes in many chemical and physical laboratories. R. S. HUTTON.

NOTES.

WE regret to announce that Sir Lowthian Bell, Bart., F.R.S., died on Tuesday, at eighty-eight years of age.

THE death of Mr. Norman Maccoll, late editor of the *Athenaeum*, at sixty-one years of age, will be deeply regretted by many men of science. Mr. Maccoll did much to further the interests of science, and to cultivate sympathy with the pursuit of natural knowledge among readers not actively engaged in scientific work.

ON Saturday last, direct telegraphic communication was established between Liverpool and Teheran, in Persia, a distance of four thousand miles. The line belongs to the Indo-European Telegraph Company.

ON Tuesday next, December 27, Mr. Henry Cunynghame will deliver at the Royal Institution the first of a Christmas course of six lectures adapted to a juvenile auditory on ancient and modern methods of measuring time, experimentally illustrated.

At the December meeting of the Astronomical Society of France an address was given by Mr. de Watteville on the temperatures of stars. The lecturer described a series of experiments made by him in the Count de Labaume Pluvinel laboratory, and exhibited a series of photographs of spectra obtained by him, reproducing the principal types described by Sir Norman Lockyer. The president congratulated the speaker on having obtained such brilliant results, on the subject of which he has already delivered a thesis at the Sorbonne.

It is announced by the *Athenaeum* that the Circolo Matematico di Palermo intends to offer an international prize for geometry at the fourth International Mathematical Congress, which will meet at Rome in 1908. The prize will consist of a small gold medal, to be called the Guiccia medal, after its founder, and of 3000 francs, and will be given by preference, though not necessarily, to an essay which advances the knowledge of the theory of algebraical curves of space. The treatises may be written in Italian, French, German, or English, and must be sent to the president of the Circolo Matematico before July 1, 1907.

WE learn from the *Times* that on Friday last President Loubet received Dr. Otto Nordenskjöld, who was presented by the Minister for Sweden and Norway in Paris. On the evening of the same day Dr. Nordenskjöld delivered a lecture on his Antarctic explorations before the French Geographical Society. Prince Gustav Adolph and Prince William of Sweden were present, and several Ministers were represented. Dr. Nordenskjöld was the guest on Saturday afternoon of the Paris Municipal Council at the Hôtel de Ville. He was welcomed by the president of the council, who presented him with a silver medal commemorating his visit to the city. On Saturday evening Dr. Nordenskjöld delivered a lecture before a large and distinguished audience at the Sorbonne.

THE death is announced of Mr. C. G. Barrett, one of the editors of the *Entomologist's Monthly Magazine*, at the age of sixty-eight years.

It is stated that at a meeting of the French Surgical Society held on December 14 a report of the committee appointed to investigate Dr. Doyen's researches on cancer and its microbe was read, and that some of the conclusions support Dr. Doyen's claims. No authentic details have, however, as yet been published.

THE following recent deaths are announced in the *Bulletin* of the French Physical Society and the *Popular Science Monthly*:—M. Jeunet, late professor of physics; Prof. Lespiault, of the University of Bordeaux; Prof. Joseph Thimont, of the École Ste.-Geneviève and other institutions; Prof. Clemens A. Winckler, professor of chemistry at Dresden; Prof. Max Berbels, of Berlin, noted for his publications on ethnology; Major Henry F. Alvord, chief of the dairy division of the U.S. Department of Agriculture.

IN the *Bulletin* of the French Physical Society, No. 219, the death is announced of Prof. Macé de Lépinay, of Marseilles, a former member of the council of the society. Prof. Macé de Lépinay's researches were mostly connected with optics, and had special reference to the determination of wave-lengths by means of interference phenomena, on the lines first laid down by Fizeau. The methods used were interference due to double refraction, interference of a direct ray with one passing through a lamina of the crystal, and interference of two rays, one passing once and the other twice through the lamina. A further series of researches dealt with the inverse problem of determining the specific mass of water. Most of the experiments were performed with sodium light. Prof. Macé de Lépinay's latest researches were conducted conjointly with M. Buisson, who proposes to complete them.

GLASS hives for the observation of bees at work have been in use for many years, and latterly ants' nests have been on view at the Crystal Palace; but it may be new to many of our readers to learn that Messrs. A. W. Gamage, Ltd., of Holborn, have actually put on sale a contrivance called "The Lubbock Formicarium," which is really a

portable ants' nest, which can be moved anywhere without trouble or inconvenience, and which, it is claimed, will last for upwards of six years with ordinary care. The species selected is the small yellow ant, *Formica flava*, and the nest is enclosed in a frame 10 inches square, resembling a picture frame, except that it must, of course, be laid flat, and the cover must be kept over it except when the ants are under observation. The nest contains ants in their various stages, and some of the other insects which are associated with them; and it is supplied with or without a queen, and accompanied by full directions as to management. This novelty has attracted considerable attention already, and the visitors, many of whom are children, show much interest in this novel exhibition.

DR. CHARLES WALDSTEIN gave a lecture on "Herculaneum and the Proposed International Excavation" at the Royal Academy on December 14. He remarked that from Herculaneum many beautiful works might be expected. The city and district of Herculaneum were overwhelmed with volcanic material, but this is not the impenetrably hard lava commonly supposed. Geologists have shown that, apart from actual contact with air, the material is perfectly friable and manageable for the excavator. The beautiful works from the city which are to be seen at Naples show that the disaster was not destructive of the beauty of the works of art at Herculaneum. Manuscripts which can be unrolled and read, as well as glass and marble, with no trace of fire on them, give good hope of what may be expected from thorough excavation. The catastrophe was a marvellous preservation of a provincial city's life at the moment of arrest. The King has expressed approval of the proposed international excavation, and the King of Italy, as well as his Prime Minister, promise support. The President of the United States, the German Emperor, the President and Government of the French Republic, the Emperor of Austria, and the King of Sweden encourage the undertaking. There is already a committee in Vienna, and it is hoped to secure the cooperation of many other national committees. Mr. Neville Rolfe, our Consul at Naples, has told Dr. Waldstein that there is ample work for many years without infringement of private rights.

OUR Norwegian namesake—*Naturen*—for November contains an illustrated account of the mammoth discovered in the Kolyma district in 1901, and now mounted in the St. Petersburg Museum. The monster has been set up in the position in which it was found, namely, endeavouring to struggle out of a quicksand or crevasse.

In the issue of the *Sitzungsberichte* of the Vienna Academy for November 10 Dr. F. Werner gives an account of the zoological results of his recent expedition to Egypt and Nubia. The most important part of the collection appears to consist of orthopterous insects—a group hitherto very imperfectly known from the countries in question, and of which a large series of specimens was obtained. Very noteworthy is the discovery of certain Central Asian species of the group in the heart of this part of Africa. A fish and a fresh-water mussel previously supposed to be confined to the Upper Nile are recorded from the delta, and some interesting observations with regard to certain reptiles have also been made.

We are indebted to the publisher—G. Freytag, of Leipzig—for copies of the two issues of the new (twenty-sixth) edition of Pokorny's "Naturgeschichte des Tierreiches," a well known zoological text-book for schools. The present enlarged edition has been supervised by Mr. M. Fischer,

of Mülhausen. The book is issued in two forms, one more expensive than the other. In the cheaper issue (of which the price is 3s. 6d.) there are only five coloured plates, whereas in the more expensive one (price 4s. 6d.) the number of illustrations of this description is twenty-nine. Some difference in the arrangement and number of the cuts distinguishes the two issues. Considering the price of the volume, the coloured illustrations are all that could be desired. The fact of the work reaching its twenty-sixth edition is a sufficient guarantee of its fitness for its special purpose.

We have received a copy of a new monthly publication, *Indian Public Health* (No. 4, vol. i.), which is to be devoted to the discussion of public health questions in our Indian Empire. We cannot help expressing the opinion that it is undesirable to multiply small journals, of which there are already too many. It would be better to enlarge the scope of the existing journals.

In the *Journal* of the Quekett Microscopical Club (ix., No. 55) Mr. T. B. Rosseter gives a good description of the anatomy of *Taenia sinuosa*, a tapeworm of geese, and proves by feeding experiments that the cysticeroids inhabit certain copepods and ostracods; and Mr. Wesché investigates some new sense-organs of Diptera, concluding that where the antennæ are not particularly sensitive, the palpi have structures to compensate, and may bear organs of touch, taste, and smell, but not more than two of these at the same time. He also describes certain organs, probably of sense, on the legs of many species, the function of which is doubtful.

We have received "Researches in Helminthology and Parasitology," by Prof. Joseph Leidy, edited by his son, Dr. Joseph Leidy (*Smithsonian Miscellaneous Collections*, part of vol. xlv.). It gives a summary of Prof. Leidy's contributions to science, with bibliography, and should prove of considerable value to those engaged in these branches of research. Commencing in 1849, Prof. Leidy's contributions were continued without intermission down to 1889, and are no less than 578 in number, many being of considerable importance, and embracing parasites of all kinds, as well as some papers on comparative anatomy.

In the report for the year 1903-4 on the administration of the Government Museum and Connemara Public Library, Madras, amongst other interesting matter the following paragraph appears:—"A prolonged tour was made in the Mysore province in connection with the ethnographic survey, with the primary object of continuing my researches into the character of the Canarese cranium (*vide Museum Bulletin*, iv., 2, 1901). The work was carried out under conditions of considerable difficulty, caused by the terror of the natives, who mistook me for a recruiting sergeant bent on seizing them for employment in South Africa or for the Somali war, and fled before my approach from town to town. The little spot, which I am in the habit of making with Aspinall's paint to indicate the position of the fronto-nasal suture when measuring the nose, was supposed to possess blistering properties, and to turn into a number on the forehead, which would serve as a means of identification. The untimely death of a Korava outside a town where I was halting was attributed to my evil eye. Villages were denuded of all save senile men, women and children. The vendors of food-stuffs in one bazaar finding business slack owing to the flight of their customers, raised their prices, and a missionary complained that the price of butter had gone up. My arrival at one important town

was coincident with a temple festival, whereat there were not sufficient men left to drag the temple car in procession. The headman of another town, when he came to take leave of me, apologised for the scrubby appearance of his chin, as the local barber had fled. One man, who had volunteered to be tested with the tintometer, was suddenly seized with fear, and, throwing his body-cloth at my feet, ran away and was no more seen. An elderly municipal peon wept bitterly when undergoing the process of measurement. Such are a few examples of the results which attend the progress of the Government anthropologist." Mr. Edgar Thurston finds that the average cephalic index of various groups of natives in the southern (Tamil and Malayalam) districts of the Madras Presidency ranges from 72.6 to 76.5, while that in the Canarese and Maratha area ranges from 77.1 to 81.8. The significance of this brachycephalic element is not yet elucidated.

In the *Transactions* of the Academy of Science of St. Louis, vol. xiii., No. 8, Mr. J. A. Harris gives some details of polygamy and floral abnormalities in species of *Solanum*. A collection of flowers of *Solanum carolinense* showed about twenty staminate to eighty perfect flowers. A second paper by the same writer describes the germination of seedlings with unequal cotyledons of *Pachira campestris*, a genus sometimes allied with *Bombax*.

THE formation of a botanic garden in sandhills does not perhaps suggest utility or success, but in the *Gardener's Chronicle* (November 19) Dr. Masters gives an account of the practical results obtained by experiments carried out in the garden, or, as it may be called, the experimental station established in the Belgian dunes at Coxide. As an instance of the way in which experimental results are sometimes opposed to theoretical supposition, the writer describes the successful formation of a forest of dwarf poplars in the sandhills, and even suggests that they would act as nurses to seedling pines.

It is characteristic of the scattered groups of islands which lie between the parallels of 45° and 60° south that in their flora they all contain a proportion of what has been termed a Fuegian element. Amongst these are the so-called Southern Islands of New Zealand, of which the latest account is that given by Dr. Cockayne in the *Transactions* of the New Zealand Institute, vol. xxxvi. The plant associations of the Auckland Isles include a forest formation, with *Olearia lyallii* as the dominant tree, which Dr. Cockayne regards as the primitive forest, and one that was previously more extensive, but which has been curtailed by the spread of a *rata* forest similar to the *rata* forests found in New Zealand. This fact, and the existence of a well marked New Zealand element in the flora are points of evidence in favour of a former extension of New Zealand to the south.

MR. A. TINGLE, of the Imperial Provincial College, Chinanfu, Shantung, has sent a further communication upon the flowering of the bamboo, in which he supplements—in view of the letters of Prof. J. B. Farmer, F.R.S., in our issue for August 11, and of Mr. J. S. Gamble, F.R.S., in *NATURE* for September 1—the information supplied in his previous letter. Mr. Tingle is unable to tell the species of the bamboos that flowered, but he reports that they were small, growing to a height of about 4 metres, and that the stems averaged about 4 cm. in circumference near the ground. All the bamboos have died since flowering. Mr. Tingle points out that the bamboo will grow in Shantung only if carefully cultivated in a garden. The seasons, he remarks, have been in no way exceptional in Shantung.

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AMONG the interesting collection of models of Palæozoic seeds and cones exhibited by Mr. H. E. H. Smedley at a recent meeting of the Linnean Society, a few are of special interest to palæobotanists. The example selected for illustration here is that of the group of three models of the sporophylls of the lycopodiaceous cone, *Lepidocarpon*, from the Carboniferous formation. The model on the left shows the general morphology of a single sporophyll, from which will be seen the peculiar shape of the integument and micropyle, much resembling a hand-bag. The centre model demonstrates the general anatomy as seen in the

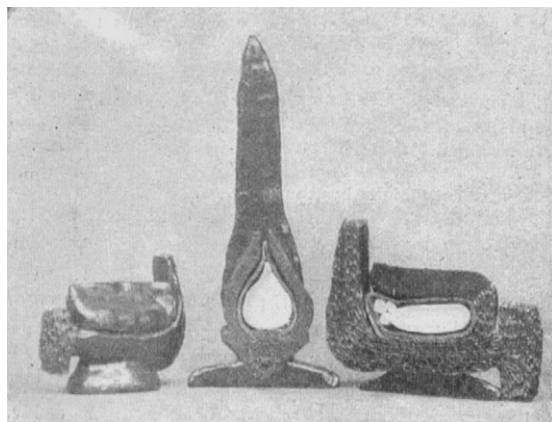


FIG. 1.—Palæozoic cones.

transverse section, and shows the complete lamina of the sporophyll, while that on the right clearly exhibits the complex internal structure of the sporangium containing four megaspores, one of which has developed a seed-like formation filling nearly the whole of the sporangium, the other three being abortive. In urging an affinity between the lycopodiaceous cones and the gymnosperms, the author submitted the following points of agreement:—Integument and micropyle, the single functional megaspore in the sporangium, and the detachment of the seed-like organ as a whole.

THE report of the Meteorological Council for the year ending March 31, 1904, shows increased activity, and is somewhat more bulky than its predecessors, extending to more than 200 pages; the report proper embraces only some 30 pages; the remainder is composed of appendices which contain details of the operations of the office. No change has taken place in the constitution of the council during the year, nor is any clue given to the future of the office resulting from the deliberations of the Meteorological Grant Committee; their report, however, was not issued until after the period to which the council's report refers. While the work of a former Government department is arduously performed, the Meteorological Office continues to hold a very anomalous position compared with similar establishments in other countries; it performs valuable public duties, but has not the status of a Government office, although supported by a Government grant. The operations may be summarised under four principal heads:—(1) ocean meteorology, the collection, tabulation, and discussion of meteorological data for all parts of the ocean, and the preparation and issue of charts and the supply of instruments to the Royal Navy and mercantile marine; (2) the issue of storm warnings to all seaports willing to receive them, of daily weather forecasts, and of forecasts for agriculturists during harvest seasons; (3) the climatology of the British Isles,

statistics relating to British colonies and dependencies, and replies to numerous meteorological inquiries from all sources; (4) the discussion of automatic registers received from the observatories and other stations in connection with the office. The library contains weather maps and other publications received from all parts of the world, and these are available to all persons wishing to consult them.

PART X. of the *Bulletin* of the Department of Agriculture of Jamaica contains an interesting article by Mr. H. H. Cousins, the Government chemist, on the possibility of manufacturing starch from cassava on such a scale as to undersell German potato starch in the English market. The high proportion of starch in cassava makes the latter twice as valuable as the potato as a raw material, and cassava has the additional advantage that it is not liable to fungoid diseases such as produce extraordinary variations in the annual potato crop in Germany. The seasons of its growth and harvest are, moreover, perfectly unrestricted.

SOME apparatus left by the late M. Félix Worms de Romilly has been offered by the French Physical Society for distribution to its members.

THE Association of Engineers of the School of Liège is organising, under Government patronage, a congress of mining, metallurgy, applied mechanics and geology, to be held at Liège from June 26 to July 1, 1905, on the occasion of the Universal Exhibition.

IN the *Physikalische Zeitschrift* for December 1 Mr. Hermann Bonin contributes an interesting report on steam turbines, based on the writings of Stodola, Feldmann, Gutermuth, and Boveri. In it the Laval, Curtis, Rateau, Zölly, and Parsons turbines are figured, and their peculiar features discussed.

PROF. R. W. WOOD contributes a paper on n -rays to the *Physikalische Zeitschrift* for December, and suggests that those experimenters who obtain positive and those who obtain negative results should arrange to make a series of joint experiments in the way that has been done in a similar case by Crémieu and Pender.

WE have received a thesis by Messrs. H. C. Crowell and G. C. D. Lenth on the "Doble" needle-regulating nozzle for fire hoses and other jets. This nozzle is furnished with a convergent mouth-piece in the centre of which is a peculiarly shaped "needle," the effect of which on the stream lines is to obviate the spraying noticeable with ordinary jets, and thus to increase the efficiency. The paper is printed by permission of the Massachusetts Institute of Technology.

PROF. N. UMOW contributes to *Terrestrial Magnetism and Applied Electricity* an ingenious method of constructing magnetic charts. It consists in developing the magnetic potential in a series of spherical harmonics, and representing on a Mercator's chart the poles of the various harmonics and curves showing their zeros and so forth. The advantage of this system is that instead of drawing a large number of magnetic curves, it is possible to convey more exact information by drawing a comparatively small number of curves indicating the various terms in Gauss's expansion.

IN a paper read before the Institution of Mechanical Engineers on November 18 Messrs. A. E. Seaton and A. Jude emphasise the need of testing materials which are to be subjected to rapidly repeated or to alternating loads by other methods than by merely determining the tensile strength and elastic limit. A form of apparatus is described by means of which the ability of a notched bar of the

material to withstand impact can be measured, and it is shown that although a high tensile strength may be accompanied by a small resistance to shock, a bar which responds satisfactorily to the impact test always has sufficient tensile strength and elasticity. The best results as regards resistance to shock are obtained with those steels which contain only a small proportion of carbon, an extraordinarily rapid increase of brittleness occurring with an increase in the percentage of carbon. The line of fracture of the metal follows the direction of the ferrite and avoids the perlite. Oil quenching has the effect of increasing the shock strength of steel to a value which is 500 per cent. to 600 per cent. greater than that of the natural steel in its best condition.

A NEW and revised edition of stage iii. of Mr. Vincent T. Murché's "Object Lessons in Elementary Science based on the Scheme issued by the London School Board" has been issued by Messrs. Macmillan and Co., Ltd.

IN the November, 1904, issue of the *Central*, the magazine of the Central Technical College Old Students' Association, Prof. H. E. Armstrong, F.R.S., continues his papers on the mechanism of combustion, and there is an illustrated description of the Manhattan railway power station of New York, contributed by Mr. W. A. Del Mar.

IN addition to the enumeration of classes and other administrative matter, the *Johns Hopkins University Circular* for November, 1904, contains one or two original papers. Among these may be mentioned one by Prof. W. B. Clark on the Matawan formation of Maryland, Delaware, and New Jersey, and its relations to overlying and underlying formations.

THE Department of Agriculture and Technical Instruction for Ireland has issued a pamphlet entitled "Notes for Manual Instructors." Manual instruction is comparatively new in Ireland; the conditions are different from those in other countries, and there are initial difficulties to be overcome. For these reasons the notes here brought together should be of real assistance to teachers of the subject.

A COPY of an almanac for the year 1905, compiled at the offices of the Egyptian Survey Department, and published by the National Printing Department at Cairo, has been received. The almanac provides full particulars of the dates of all the important meetings of the various Government departments, and gives information on points in connection with the Government regulations which should be of service to tourists and residents.

IN view of the largely increased facilities provided within the past few years by the publication departments of various institutions, and more especially by the Carnegie Institution, for the promotion of original research with its incident publications, the Wagner Free Institute of Science, Philadelphia, has decided to discontinue for the present its work in this department, and to devote its energies more exclusively to other purposes indicated by its founder.

WE have received a copy of the "Guide to the Archives of the Government of the United States in Washington," just published by the Carnegie Institution of Washington. The guide was begun by Mr. C. H. Van Tyne and Mr. W. G. Leland, and completed by the newly organised Bureau of Historical Research. The original purpose of the guide was to gather information of the whereabouts of important historical materials, but as the work proceeded it was found desirable carefully to deal with all administrative records. The work, in fact, developed into a survey of all the branches, bureaus, and divisions of the Federal Government in Washington.

Two new volumes have been added to Ostwald's series of scientific classics, published by Mr. W. Engelmann, Leipzig (London: Williams and Norgate), bringing the number of reprints and translations in the collection up to 145. One of the volumes is a translation, by Herr F. Plehn, of Kepler's "Dioptrice," with an introduction, notes, and sketch of Kepler's life and work. The second volume (No. 145) contains reprints of two papers by Kekulé, edited with notes by Herr A. Ladenburg; the papers are:—"Über die Constitution und die Metamorphosen der chemischen Verbindungen und über die chemische Natur des Kohlenstoffs" and "Untersuchungen über aromatische Verbindungen."

THE annual report of the Smithsonian Institution for the year ending June 30, 1903, has been received. As usual, the general appendix makes up the greater part of the volume. The excellent and varied selection of beautifully illustrated papers by men of science of all nationalities, constituting the general appendix, provides a trustworthy indication of the extent and nature of the progress in science during the twelve months with which the report deals. It is impossible here to give even the titles of the fifty-three papers included. Some of the papers have been reprinted from NATURE and other periodicals, some are addresses delivered before scientific bodies, and a few are new contributions. In addition to these works there are a number of translations of papers originally published in other languages. The first place is given to a reprint of the general description of the moon included by Prof. N. S. Shaler in the introductory chapter of his memoir on "A Comparison of the Features of the Earth and the Moon." This paper is illustrated by ten magnificent plates. The work done on radium and radio-activity is chronicled in papers by M. E. Curie, Prof. J. J. Thomson, Sir William Ramsay, Mr. Soddy, Sir Oliver Lodge, Sir William Crookes—the names being mentioned in the order in which the papers are printed. Geographical research is represented by contributions by Captain E. W. Creak, Mr. Alfred H. Brooks, Commander Peary, Sir Clements R. Markham, Dr. Otto Nordenskjöld, M. G. Ts. Tsybikoff, and others. The articles on geographical and zoological subjects are illustrated very profusely, and the volume will make a valuable addition to reference libraries fortunate enough to secure copies of it.

OUR ASTRONOMICAL COLUMN.

DISCOVERY OF A NEW COMET (1904 d).—A telegram from the Kiel Centralstelle announces that a new comet was discovered by M. Giacobini at Nice on December 17-11. Its position at 17h. 41.3m. (M.T. Nice) was

R.A. = 16h. 14m. 40s., dec. = +27° 28',

and its movement was in a north-easterly direction.

This position is situated on the western boundary of the constellation Hercules, about 44m. east of α Coronæ, which has approximately the same declination (27° 2'), and is favourably situated for observation during the three or four hours preceding dawn.

A second telegram from Kiel informs us that the comet was again observed at Nice on December 18. Its position at 16h. 44m. (M.T. Nice) was as follows:—

R.A. = 16h. 17m. 34s., dec. = +27° 54' 8".

TEMPEL'S COMET (1904 c).—The following details of M. St. Javelle's re-discovery of Tempel's second comet are given in No. 3984 of the *Astronomische Nachrichten*:—

M.T. Nice			R.A. (app.)			Dec. (app.)		
h. m. s.			h. m. s.			h. m. s.		
Nov. 30	6	7 48	...	19	36 39.89	...	-24	48 37.3
Dec. 1	5	55 10	...	19	40 23.58	...	-24	46 17.5

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The comet was a feeble and ill-defined object as seen in the Nice equatorial of 0.76 m. aperture, and had the appearance of a whitish spot 1'.5 to 2'.0 in extent; no nucleus was visible.

A continued abstract of M. Coniel's daily ephemeris (*Astronomische Nachrichten*, No. 3971) is given below:—

12h. M.T. Paris.

1904	α (app.) h. m. s.	δ (app.)	log Δ	$r: r^2 \Delta^2$
Dec. 20	20 51 30	-22 55	0.31206	0.113
" 22	20 58 39	-22 36	0.31480	
" 24	21 5 43	-22 17	0.31760	0.108
" 26	21 12 44	-21 57	0.32044	
" 28	21 19 41	-21 35	0.32333	0.103
" 30	21 26 35	-21 13	0.32626	

1905

Jan. 1	21 33 24	-20 50	0.32924	0.098
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ENCKE'S COMET (1904 b).—An observation of Encke's comet was made by Herr van d Bilt at Utrecht on December 8. At 8h. 3m. 46s. (M.T. Utrecht) the position of the comet was

α (app.) = 20h. 46m. 22.11s., δ (app.) = +5° 12' 29".5,

and its magnitude was estimated as 7.5. This observation indicated that a correction of +41s., +1'.2 was necessary to the ephemeris published by Messrs. Kaminsky and Ocoulitsch in *Astronomische Nachrichten*, No. 3981 (*Astronomische Nachrichten*, No. 3985).

OBSERVATIONS OF OCCULTATIONS BY PLANETS.—Dr. T. J. J. See, writing to the *Astronomische Nachrichten* (No. 3984), explains the futility of making observations of occultations by planets for the purpose of determining the extent of the planetary atmospheres. He points out that the extent of the irradiation about a planet's disc, at night time, in every case exceeds the probable extent of the planet's atmosphere, so that the star is lost in the irradiation zone before the interposition of the atmosphere between it and the observer.

Thus observations of this character, made during the hours of darkness when the irradiation affects the observation, can never succeed in determining the amount of refraction suffered by the star light in passing through the planet's atmosphere, because the star is always hidden before it reaches even the outer limit of that atmosphere.

RELATIVE DRIFT OF THE HYADES STARS.—In a paper communicated to the British Astronomical Association Dr. Downing, F.R.S., discusses the resulting values obtained by Herr Weersma, and published in No. 13 of the Groningen Astronomical Laboratory *Publications*, in order to determine the relative drift of the sixty-six Hyades stars dealt with by the latter observer.

The results of the discussion show that these stars may be arranged in three chief groups as regards the amount and direction of their annual motion. The first group contains thirty-eight stars, including most of the bright ones except Aldebaran, having a mean motion of 0".096 per year in the mean direction 106° from north towards east. In the second group Aldebaran and three faint stars are included, and the annual mean motion is as much as 0".160 in the mean direction 160°. In both these groups the magnitudes are in no way related to the amounts of movement, some of the fainter stars, in fact, having a greater apparent motion than the brighter ones in the same group. The values for the third group are 0".036 and 254° respectively, and it is reasonably conjectured that this group is at a greater distance from our system than the others (*Journal British Astronomical Association*, No. 1, vol. xv.).

DESIGNATIONS OF THE VARIABLE STARS DISCOVERED DURING 1904.—In No. 3984 of the *Astronomische Nachrichten* the Variable Star Commission of the Astronomischen Gesellschaft publish a catalogue of fifty-eight new variables, discovered by various observers during the present year. They give for each star the number by which it will in future be known, the temporary designation which this replaces, its coordinates and the amount of precession in each coordinate, for 1900, and the magnitude. The catalogue is followed by a detailed account of the discovery, variations, and general characteristics of each variable.